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Grafting-Wax MELTER



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U. S. DEPARTMENT OF AGRICULTURE

GRAFTING-WAX MELTER

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Types in Use

One requisite for the successful grafting of horticultural plants is the protection of all wounded surfaces from drying out. When the point of grafting is above the ground, some form of wax is commonly used. Some propagators use a hand wax, but many prefer a hard wax, which must be melted when applied. If a hard wax is used, a means of melting it and keeping it at the proper temperature for application is needed. In a study of pecan grafting methods and waxes¹ conducted at the United States Pecan Field Laboratory at Shreveport, La., several of the melters on the market at the time were used, but none were entirely satisfactory. Each had one or more defects. Either they did not hold enough wax, or the flame was easily extinguished by wind, or because the fuel reservoir was within the heated compartment the fuel expanded, overflowed around the burner, and ignited. Frequently, too, the wax was set on fire. In three of the melters used, the wax was thus ignited, and all of the solder joints were melted, and the melter fell apart.

New Melter Developed by Bureau Workers

A grafting-wax melter, designed and constructed at small cost at the United States Pecan Field Laboratory has been found to overcome these troubles and to give satisfactory service.

The melter consists of a large pail, inside of which a smaller one is suspended. The wax is placed in the small pail. The chamber between the larger and the smaller pails is heated by the flame of some suitable fuel, preferably alcohol. The fuel reservoir of the burner is separated from the heated chamber by a false bottom with the wick tube of the burner extending through a hole in its center. The reservoir is further protected from the heat of the flame by openings in the side of the larger pail below the false bottom to permit free circulation of air around the reservoir. The false bottom and the ventilation of the fuel reservoir prevent the fuel from becoming overheated. Ample wax capacity is provided by using a half-gallon pail for the wax. This melter was found to burn very steadily even when there was considerable wind, because the location of the ventilation holes at the corners of the false bottom prevented the wind from blowing directly on the flame.

¹ U. S. Department of Agriculture Circular 545, Studies on Pecan Grafting Methods and Waxes. Additional information applicable to other nut and fruit trees is given in Farmers' Bulletins 1501, Nut Tree Propagation, and 1567, Propagation of Trees and Shrubs, and in publications of the various State agricultural experiment stations.

Construction

Details of the construction of the new grafting-wax melter are shown in figure 1. The dimensions shown are suitable for a melter having a half-gallon sirup pail for holding the wax and a small alcohol-

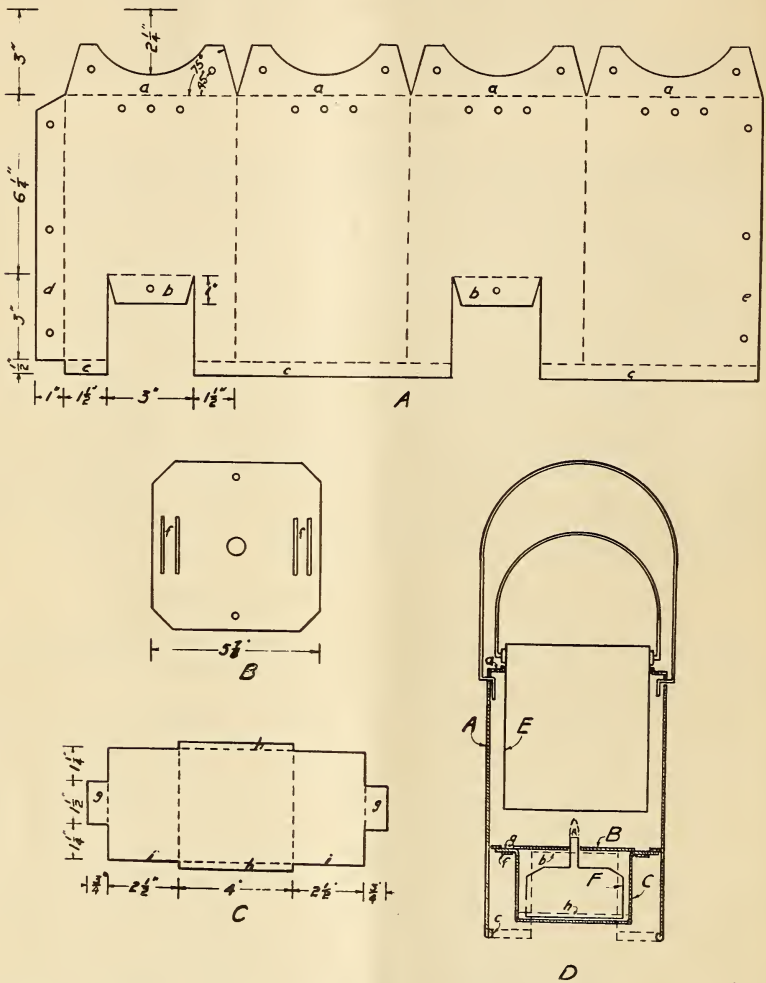


FIGURE 1.—Details of the construction of a grafting-wax melter. *A*, Plan for the larger pail, or body of the melter; *B*, plan for the false bottom; *C*, plan for the burner support; *D*, sectional view of the assembled burner; *E*, pail for holding the wax; *F*, alcohol burner. Lower-case letters designate parts for convenient reference in the text; like letters designate like parts.

burning lamp with a $\frac{1}{4}$ -inch round, adjustable wick. Modification in the dimensions should be made for a pail or a burner of another size.

When alcohol is used as the fuel the distance from the bottom of the smaller pail to the top of the wick tube should be from 1 to $1\frac{1}{2}$ inches. The flame should not come in contact with the bottom of the wax pail

nor much closer than $\frac{3}{4}$ inch; if it does, a small spot on the bottom may be burned out. However, the flame should not be much more than $1\frac{1}{2}$ inches away from the bottom because then the flame will need to be larger to keep the wax at the proper temperature and will consume more alcohol than necessary.

The parts of the melter shown as *A*, *B*, and *C* in figure 1 were cut from 24-gage galvanized sheet iron, although other thicknesses may be used. The body of the melter, or larger pail, is shown in *A*. Parts *c* are folded or rolled to give stiffness, and additional strength may be obtained by rolling over a piece of stiff wire. This roll forms the bottom of the pail and must carry the completed melter when it is set down. Flanges *a* are bent to an angle of 90° and form the support for the smaller pail. Flanges *b* are likewise bent to an angle of 90° in the same direction as *a* and form brackets on which the false bottom rests. The sheet is then bent along the vertical dotted lines in the same direction, each bend being to an angle of 90° , to a rectangular form with flanges *a* and *b* on the inner side. Flanges *a* will lap at their ends and are fastened together with $\frac{1}{8}$ - by $\frac{1}{2}$ -inch stove bolts or with rivets through the holes provided. Unless equipment is available for accurately bending the sheet metal along the lines, it is advisable to punch only one hole in each *a* flange before bending. After bending, the other holes can be punched so as to aline with the previously punched holes.

Similarly, holes along edge *d* may be punched before bending and those along edge *e* punched after bending. The edges *d* and *e* are bolted together, and the body is formed having an open bottom and a top with a circular opening. The edges of the top opening are bent upward or rolled until the opening is large enough for the smaller pail to go into it and rest on the rolled edge by the bail ears. The rolled edge not only serves to strengthen the top but prevents the melted wax, which may drip from the brush when applying the wax to the graft, from running into the heating compartment.

The plan for the false bottom is shown as *B*. This should be slightly smaller than the cross section of the body so that it will go inside the body and rest on the brackets formed by the flanges (*A*, *b*). A hole is punched in the center to permit the wick tube of the burner to extend through the false bottom. Two parallel slots (*B*, *f*) are cut in opposite sides, and the metal between each pair of slots is bent so that the tabs (*C*, *g*) of the burner support can be woven through them. The corners are cut on a bias to provide ventilation for the burner flame.

The plan for the support for the burner is shown as *C*. The tabs (*g*) are bent along the dotted lines to an angle of 90° in the same direction. The sheet is then bent along the other dotted lines to an angle of 90° in a direction opposite to that of the tabs. When the tabs are inserted in the slots of the false bottom an underslung support is provided for the alcohol burner, two sides of which are solid and the other two sides open except for flanges (*h*), which should be bent to an angle of 90° to prevent the burner from sliding out of the support. The dimensions of *i* should be such that when the burner rests in the support the wick tube will extend one-quarter to one-half inch above the false bottom. For many of the burners available, this dimension may be $2\frac{1}{2}$ inches, as shown in figure 1.

Assembling

A sectional view showing the relative position of the various parts is shown as *D*. In assembling the melter, the false bottom is inserted through the open bottom and placed above the brackets on which it rests with the slots toward the solid sides of the body; the open sides of the burner support will then be adjacent to the open sides of the body to allow free movement of air around the fuel reservoir. The

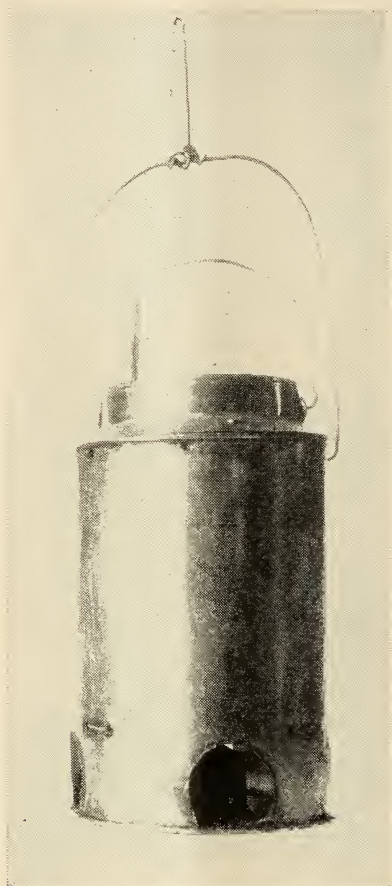


FIGURE 2.—Grafting-wax melter made from one 5-quart and one 2-quart cylindrical can.

false bottom may be bolted to the brackets if desired. The burner is then placed in the support; and, with the wick tube extending through the false bottom, the tabs of the support are woven through the slots of the false bottom. The burner is lighted and the flame adjusted. The smaller pail with the wax to be melted is suspended in the opening at the top of the body.

A bail having a stiff wire hook at its center is attached by inserting its ends in the two middle holes on opposite sides at the top of the

body. The hook (shown in figure 2) serves to hang the melter to a branch while the operator is preparing and making the graft. The additional holes at the top of the body sides are for ventilation for the flame of the burner.

A melter having features similar to the one just described may readily be made using a cylindrical can 6 to 7 inches in diameter and 9 to 10 inches high for the larger pail (fig. 2).

If such a can is used, a circular opening is made in one end of the can so that the smaller pail in which the wax is to be melted may be suspended inside the larger pail, as previously described. A disk slightly smaller than the inside diameter of the can is cut from another sheet of metal for the false bottom. Support for the false bottom may be provided by running wire through four small holes equally spaced around the circumference of the can and at such a distance from the bottom that when the burner rests on the bottom the wick tube will extend slightly above the false bottom.

Ventilation for the fuel reservoir is provided by cutting away a part of the side of the large pail below the false bottom. Ventilation for the flame is provided by holes punched near the periphery of the false bottom and just below the top rim of the larger pail.

In assembling the melter the burner is placed on the bottom of the larger pail, the false bottom is placed on the wires with the burner tube extending through the false bottom, the burner is then lighted, and the smaller pail with the wax to be melted is suspended inside the larger pail.

5/22